Caltrans

Construction Storm Water Pollution Prevention Bulletin

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The Storm Water Pollution Prevention Bulletin is prepared by the Storm Water Compliance Review Task Force to aid all projects and operations in maintaining compliance with the National Pollutant Discharge Elimination System (NPDES) permit requirements.

Reducing Storm Water Erosion With Diversion Ditches and Berms

Erosion control is an essential element in the storm water pollution prevention program of every construction project. Erosion introduces sediment into storm water that eventually is transported to rivers, lakes, reservoirs, and the ocean. Once deposited into a water system, excessive sediment upsets the natural structure and balance of the habitat.

Storm water on slopes with exposed soils creates a formidable and common foe in the battle to control erosion on construction sites. This bulletin reviews the Best Management Practices (BMP) in **CD32B(2) Top and Toe of Slope Diversion Ditches/Berms** that help reduce slope erosion, and reviews other erosion control practices.

Exposed Slopes + Storm Water = Erosion

Storm water flows faster down slopes, forming rills and gullies in exposed soil areas. Flowing water concentrates in these rills and gullies, increasing in speed and volume, scouring the soil from the slope, and carrying the resulting sediment to storm drain systems or watercourses. Conditions that contribute to the erosiveness of storm water on slopes include:

- Length and angle of the slope face
- Soil type and compaction
- Tendency of flow to concentrate in rill areas
- Extent of soil exposure on the slope
- Volume of water flowing down the slope face

Since construction personnel have little or no control over such factors as soil type and the tendency of water to concentrate in rills, it is important to focus on the factors over which there is control.

Reduce Water Flow

Since water flow causes erosion, the primary consideration is reducing the volume of water that is flowing on the slope. This can be accomplished by:

- ✓ Directing storm water runoff away from an exposed slope face to a stable conveyance such as a slope drain.
- ✓ Directing storm water runoff along a ditch or berm and into an existing drainage system.
- ✓ Intercepting off-site storm water run-on and directing it around the project site.

Minimize Soil Exposure

Soil stabilization BMPs are very effective at reducing erosion caused by water flowing across disturbed soil areas. Standard soil stabilization measures include:

- Temporary Seeding, CD24B(2)
- Chemical Soil stabilizers, CD26A(2)
- Geo-textile Mats and Erosion Control Blankets, CD26B(2)
- Mulches, CD25(2)

BMP CD32B(2) to the Rescue

Top and Toe of Slope Diversion Ditches/Berms provide effective and economical measures for reducing water flow on slopes. Refer to the *Caltrans Storm Water Quality Handbooks, Construction Contractors Guide and Specifications* for details of this BMP. The following are typical situations where CD32B(2) can be successfully implemented:

If an **existing storm water system** must be removed during the course of the project, a temporary drainage system can be installed using plastic sheeting and sandbags to form a lined ditch to convey water away from slopes, and thereby reducing erosion, until the permanent system and erosion control devices are in place.

To prevent storm water erosion during grading operations for cut and fill slopes, construct temporary ditches or berms to divert water to a retention basin; and if the water is of acceptable clarity, divert to the permanent drainage or erosion control systems.

If pavement and drainage construction *is* completed, but the curb and gutter or dike construction *is not* completed, place a sandbag berm along the edge of the pavement to divert the water to a completed drainage system.

Other Considerations

- ✓ Use the right material to create the diversion ditch or berm.
- ✓ Line ditches or berms exposed to high velocity flows.
- ✓ Construct permanent, lined ditches above and below slopes, per the contract documents, as early as possible.
- ✓ Construct final curb and dike work, per the contract documents, as early as possible.
- ✓ Install permanent landscaping as early as possible on finished ground surfaces.
- ✓ Remove temporary conveyance systems completely when they are no longer needed, or at the end of construction.
- ✓ Perform maintenance of temporary ditches and berms to ensure that they are functioning at optimum levels.

Additional information is available in the Caltrans Storm Water Quality Handbooks. Questions or comments may be directed to:

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